

70250

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: SEIDEL, Christoph  
WEINHUES-THELEN, Ursula-Henrike  
SCHMITT, Urban  
JUNG, Günther-Gerhard  
IHLENFELDT, HANS-Georg  
KRAAS, Wolfgang
- (ii) TITLE OF INVENTION: Method for serological typing using  
type-specific antigens
- (iii) NUMBER OF SEQUENCES: 46
- (iv) CORRESPONDENCE ADDRESS:  
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(C) CITY: Washington  
(D) STATE: D.C.  
(E) COUNTRY: U.S.A.  
(F) ZIP: 20005-5701
- (v) COMPUTER READABLE FORM:  
(A) MEDIUM TYPE: Floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:  
(A) APPLICATION NUMBER: unknown  
(B) FILING DATE: 04-28-1997  
(C) CLASSIFICATION:
- (vii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: US 08/598,993  
(B) FILING DATE: 09-FEB-1996
- (viii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: DE 195 04 302.2  
(B) FILING DATE: 09-FEB-1995
- 25

## (viii) ATTORNEY/AGENT INFORMATION:

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## (ix) TELECOMMUNICATION INFORMATION:

- (A) TELEPHONE: (202)638-5000
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## (2) INFORMATION FOR SEQ ID NO: 1:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

Glu	Thr	His	Val	Thr	Gly	Gly	Ser	Ala	Gly	His	Thr	Val	Ser	Gly	Phe
1				5					10					15	
Val	Ser	Leu	Leu	Ala	Pro	Gly	Ala	Lys	Gln	Asn	Val	Gln	Leu	Ile	
			20					25					30		

## (2) INFORMATION FOR SEQ ID NO: 2:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

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Glu Thr His Val Thr Gly Gly Asn Ala Gly Arg Thr Thr Ala Gly Leu  
1 5 10 15

Val Gly Leu Leu Thr Pro Gly Ala Lys Gln Asn Ile Gln Leu Ile  
20 25 30

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

(vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

His Thr Arg Val Thr Gly Gly Val Gln Gly His Val Thr Ser Thr Leu  
1 5 10 15

Thr Ser Leu Phe Arg Pro Gly Ala Ser Gln Lys Ile Gln Leu Val  
20 25 30

(2) INFORMATION FOR SEQ ID NO: 4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

(vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

His Thr His Val Thr Gly Gly Arg Val Ala Ser Ser Thr Gln Ser Leu  
 1 5 10 15

Val Ser Trp Leu Ser Gln Gly Pro Ser Gln Lys Ile Gln Leu Val  
 20 25 30

## (2) INFORMATION FOR SEQ ID NO: 5:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

Asp Thr His Val Thr Gly Gly Ala Gln Ala Lys Thr Thr Asn Arg Leu  
 1 5 10 15

Val Ser Met Phe Ala Ser Gly Pro Ser Gln Lys Ile Gln Leu Ile  
 20 25 30

## (2) INFORMATION FOR SEQ ID NO: 6:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

Glu Thr His Val Thr Gly Gly Ser Ala Gly His Thr Val Ser Gly Phe  
 1 5 10 15

Val Ser Leu Leu Ala Pro Gly Ala Lys Gln Asn Val Gln Leu Ile  
 20 25 30

## (2) INFORMATION FOR SEQ ID NO: 7:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Gln Thr His Thr Val Gly Gly Ser Thr Ala His Asn Ala Arg Thr Leu  
 1 5 10 15

Thr Gly Met Phe Ser Leu Gly Ala Arg Gln Lys Ile Gln Leu Ile  
 20 25 30

## (2) INFORMATION FOR SEQ ID NO: 8:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

Thr Thr Tyr Ser Ser Gly Gln Glu Ala Gly Arg Thr Val Ala Gly Phe  
 1 5 10 15

Ala Gly Leu Phe Thr Thr Gly Ala Lys Gln Asn Leu Tyr Leu Ile  
 20 25 30

## (2) INFORMATION FOR SEQ ID NO: 9:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

Ser Thr Gln Val Thr Gly Gly Gln Ala Ala His Thr Val Arg Gly Val  
 1 5 10 15

Ala Ser Ile Phe Ser Pro Gly Ser Arg Gln Asp Ile Ser Leu Ile  
 20 25 30

## (2) INFORMATION FOR SEQ ID NO: 10:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

20

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

Ser Thr Ile Val Ser Gly Gly Thr Val Ala Arg Thr Thr His Ser Leu  
 1 5 10 15

Ala Ser Leu Phe Thr Gln Gly Ala Ser Gln Lys Ile Gln Leu Ile  
 20 25 30

## (2) INFORMATION FOR SEQ ID NO: 11:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

Thr Ala Ser Arg Gln Ala Glu Val Ile Ala Pro Ala Val Gln Thr Asn  
 1 5 10 15

Trp Gln Lys Leu Glu Thr  
 20

## (2) INFORMATION FOR SEQ ID NO: 12:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

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Thr Ala Ser Arg His Ala Glu Val Ile Thr Pro Ala Val Gln Thr Asn  
1                   5                   10                   15

(2) INFORMATION FOR SEQ ID NO: 13:

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

Trp Arg Ala Leu Glu Val  
20

(2) INFORMATION FOR SEQ ID NO: 14:

(ii) MOLECULE TYPE: peptide

(vi) ORIGINAL SOURCE:  
(A) ORGANISM: Hepatitis C Virus



## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

Gln Ala Ser Lys Gln Ala Gln Asp Ile Gln Pro Ala Val Gln Ala Ser  
 1 5 10 15

Trp Pro Lys Val Glu Gln  
 20

## (2) INFORMATION FOR SEQ ID NO: 15:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

Gln Ala Thr Arg Gln Ala Gln Asp Ile Gln Pro Ala Ile Gln Ser Ser  
 1 5 10 15

Trp Pro Lys Leu Glu Gln  
 20

## (2) INFORMATION FOR SEQ ID NO: 16:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys  
1 5 10 15  
Trp Arg Thr Leu Glu Ala  
20

## (2) INFORMATION FOR SEQ ID NO: 17:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

- (vi) ORIGINAL SOURCE:  
(A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

Ala Asn His Asp Ser Pro Asp Ala Glu Leu Ile Glu Ala Asn Leu Leu  
1 5 10 15  
Trp Arg Gln Glu  
20

## (2) INFORMATION FOR SEQ ID NO: 18:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

- (vi) ORIGINAL SOURCE:  
(A) ORGANISM: Hepatitis C Virus

mf

Thr His His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu  
1 5 10 15  
Trp Arg Gln Glu  
20

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(vi) ORIGINAL SOURCE:  
(A) ORGANISM: Hepatitis C Virus

Thr His His Val Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu  
1 5 10 . 15

Trp Arg Gln Glu  
20

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 16 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(vi) ORIGINAL SOURCE:  
(A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

Thr	His	Gly	Lys	Ala	Tyr	Asp	Val	Asp	Met	Val	Asp	Ala	Asn	Leu	Phe
1				5					10					15	

## (2) INFORMATION FOR SEQ ID NO: 21:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 16 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

Thr	His	Lys	Thr	Ala	Tyr	Asp	Cys	Asp	Met	Val	Asp	Ala	Asn	Leu	Phe
1				5					10					15	

## (2) INFORMATION FOR SEQ ID NO: 22:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

Thr	Arg	His	Thr	Pro	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala	Asn	Leu	Leu
1				5					10					15	

Trp Arg Gln Glu

36

## (2) INFORMATION FOR SEQ ID NO: 23:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

Pro Glu Gln Val Glu Leu Gln Pro Pro Pro Gln Gly Gly Val Val Thr  
 1 5 10 15

Pro Gly

## (2) INFORMATION FOR SEQ ID NO: 24:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

Phe Glu Pro Val Gly Ser Ala Pro Pro Ser Glu Gly Glu Cys Glu Val  
 1 5 10 15

Ile Asp

## (2) INFORMATION FOR SEQ ID NO: 25:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

Ala Glu Leu Ala Thr Arg Ser Phe Gly  
1 5

## (2) INFORMATION FOR SEQ ID NO: 26:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

Ala Glu Leu Ala Thr Lys Ser Phe Gly  
1 5

## (2) INFORMATION FOR SEQ ID NO: 27:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: peptide

(vi) ORIGINAL SOURCE:

(A) ORGANISM: Hepatitis C Virus

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:

Ala Glu Leu Ala Thr Lys Thr Phe Gly  
1 5

(2) INFORMATION FOR SEQ ID NO: 28:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 13 amino acids

(B) TYPE: amino acid

(C) STRANDEDNESS:

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(vi) ORIGINAL SOURCE:

(A) ORGANISM: Hepatitis C Virus

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

Gln Gln Leu Ala Ile Lys Ser Phe Gly Gln Pro Pro Pro  
1 5 10

(2) INFORMATION FOR SEQ ID NO: 29:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 13 amino acids

(B) TYPE: amino acid

(C) STRANDEDNESS:

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(vi) ORIGINAL SOURCE:

(A) ORGANISM: Hepatitis C Virus

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

Arg Glu Met Ala Asp Lys Val Leu Ser Pro Leu Gln Asp  
 1 5 10

(2) INFORMATION FOR SEQ ID NO: 30:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(vi) ORIGINAL SOURCE:

- (A) ORGANISM: Hepatitis C Virus

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

Ala Glu Leu Ala Thr Lys Thr Phe Gly  
 1 5

(2) INFORMATION FOR SEQ ID NO: 31:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Pro of position 1."

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 18

40



(D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Tyr at position 18."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

Pro Ile Pro Lys Ala Arg Arg Pro Glu Gly Arg Thr Trp Ala Gln Pro  
1 5 10 15

Gly Tyr

(2) INFORMATION FOR-SEQ ID NO: 32:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Pro of position 1."

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 18
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Tyr at position 18."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

Pro Ile Pro Lys Asp Arg Arg Ser Thr Gly Lys Ser Trp Gly Lys Pro  
1 5 10 15

Gly Tyr

41

## (2) INFORMATION FOR SEQ ID NO: 33:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ala of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 21
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Gly at position 21."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 33:

Ala	Thr	Arg	Asp	Gly	Lys	Leu	Pro	Ala	Thr	Gln	Leu	Arg	Arg	His	Ile
1				5				10						15	
Asp	Leu	Leu	Lys	Gly											
					20										

## (2) INFORMATION FOR SEQ ID NO: 34:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

42

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ala of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 21
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Gly at position 21."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 34:

Ala	Ala	Arg	Asn	Ser	Ser	Ile	Pro	Thr	Thr	Thr	Ile	Arg	Arg	His	Val
1				5					10					15	
Asp Leu Leu Val Gly															
20															

## (2) INFORMATION FOR SEQ ID NO: 35:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ala of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 21
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Met at position 21."

43

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 35:

Ala Val Gln Gln Pro Gly Ala Leu Thr Gln Gly Leu Arg Thr His Ile  
 1 5 10 15

Asp Met Val Val Met  
 20

## (2) INFORMATION FOR SEQ ID NO: 36:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ala of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 21
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Met at position 21."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 36:

Ala Val Lys His Arg Gly Ala Leu Thr Arg Ser Leu Arg Thr His Val  
 1 5 10 15

Asp Met Ile Val Met  
 20

## (2) INFORMATION FOR SEQ ID NO: 37:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified-site

(B) LOCATION: 1

(D) OTHER INFORMATION: /note= "A biotin group is attached to Ser of position 1."

(ix) FEATURE:

(A) NAME/KEY: Modified-site

(B) LOCATION: 9

(D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Gln at position 9."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 37:

Ser Gln His Leu Pro Tyr Ile Glu Gln  
1 5

(2) INFORMATION FOR SEQ ID NO: 38:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 9 amino acids

(B) TYPE: amino acid

(C) STRANDEDNESS:

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified-site

(B) LOCATION: 1

(D) OTHER INFORMATION: /note= "A biotin group is attached to Ala of position 1."

(ix) FEATURE:

(A) NAME/KEY: Modified-site

(B) LOCATION: 9

(D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Gln at position 9."

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 38:

Ala Ser His Leu Pro Tyr Ile Glu Gln  
1 5

(2) INFORMATION FOR SEQ ID NO: 39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ala of position 1."

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 9
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Glu at position 9."

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 39:

Ala Ser Arg Ala Ala Leu Ile Glu Glu  
1 5

(2) INFORMATION FOR SEQ ID NO: 40:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

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## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ala of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 9
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Glu at position 9."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Ala Ser Lys Ala Ala Leu Ile Glu Glu  
1 5

## (2) INFORMATION FOR SEQ ID NO: 41:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Gln of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 9
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Thr at position 9."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Gln Lys Ala Leu Gly Leu Leu Gln Thr  
1 5

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## (2) INFORMATION FOR SEQ ID NO: 42:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ser of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 9
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Gln at position 9."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Ser Lys Ile Gln Gly Leu Leu Gln Gln  
1 5

## (2) INFORMATION FOR SEQ ID NO: 43:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Ser of position 1."

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## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 15
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Asp at position 15."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Ser	Arg	Arg	Phe	Ala	Gln	Ala	Leu	Pro	Val	Trp	Ala	Arg	Pro	Asp
1				5					10					15

## (2) INFORMATION FOR SEQ ID NO: 44:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Pro of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 15
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Asp at position 15."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Pro	Arg	Lys	Phe	Pro	Pro	Ala	Leu	Pro	Ile	Trp	Ala	Arg	Pro	Asp
1				5					10					15

49

## (2) INFORMATION FOR SEQ ID NO: 45:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Lys of position 1."

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 15
- (D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to Asp at position 15."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Lys	Lys	Arg	Phe	Pro	Pro	Ala	Leu	Pro	Ala	Trp	Ala	Arg	Pro	Asp
1				5				10					15	

## (2) INFORMATION FOR SEQ ID NO: 46:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 15 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

## (ii) MOLECULE TYPE: peptide

## (ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 1
- (D) OTHER INFORMATION: /note= "A biotin group is attached to Arg of position 1."

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## (ix) FEATURE:

(A) NAME/KEY: Modified-site

(B) LOCATION: 15

(D) OTHER INFORMATION: /note= "A NH<sub>2</sub> group is attached to  
Asp at position 15."

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

Arg	Arg	Lys	Phe	Pro	Pro	Ala	Leu	Pro	Pro	Trp	Ala	Arg	Pro	Asp
1				5				10						15